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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/718,438
Filing Date: November 20, 2003
Appellant(s): REIN ET AL.

**MAILED
JUN 16 2006
GROUP 3700**

Gerald. E. McGlynn, III
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3/20/06 appealing from the Office action mailed 9/23/05.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

JP404000063A	ARAI	6-1992
6,557,457	HART	5-2003

3,479,929	FANGMAN	11-1969
4,984,544	DEBIASSE	1-1991
5,039,285	LINDSTROM	8-1991

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-8, 11-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP404000063A (referred to by the application number JP2-100821 in the Final Rejection, but the document is the same) in view of Hart et al (6,557,457). Note a piston 2, connecting rod 3, and a piston pin 1a having a smoothly profiled outer circumference that is substantially circular in cross section with a larger diameter at the distal ends than at the center portion, which tapers gradually from the distal ends to the center portion. JP404000063A shows everything except the end of the connecting rod aligned with the piston bore including a phosphatized coating that is adapted to facilitate relative angular movement between the bore extending through the connecting rod and the outer circumference of the piston pin. Hart et al teach that it is old in the art to provide a phosphatized coating on at least one of the running surfaces of the wrist pin, connecting rod bore and piston pin bores (see abstract and column 2, lines 47-60). It

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would have been obvious to one having ordinary skill in the art to modify JP404000063A by providing a phosphatized coating on the inside surface of the connecting rod bore and piston pin bore and/or the outside surface of the piston pin in lieu of a conventional bushing usually pressed into the connecting rod bore, in order provide the necessary tribological properties therebetween, more simply and inexpensively (see abstract). In addition, Hart et al show a slightly different range of thickness of phosphate coating than that of applicant's; i.e. applicant claims a range of 2 to less than 8 micrometers, and Hart et al show a range of about 8 to 15 micrometers. According to MPEP 2144.05 (1), a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties.

Claims 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP404000063A in view of Hart et al (6,557,457) as applied to claims 1, 2, 4-8, 11-13, 15, and 16 above, and further in view of Fangman (3,479,929). JP404000063A in view of Hart et al show everything except employing a tapering connecting rod and bore housing. Fangman teaches that it is old in the art to provide a tapering connecting rod and bore housing (see Figure 1). It would have been obvious to one having ordinary skill in the art to modify JP404000063A in view of Hart by providing a tapering connecting rod and bore housing, in order to reduce the mass of the rod, while maintaining surface area connection between piston and rod (see column 1, lines 19-25 of Fangman).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP404000063A in view of Hart et al (6,557,457) as applied to claims 1, 2, 4-8, 11-13, 15, and 16 above, and further in view of DeBiasse (4,984,544). JP404000063A in view of Hart et al teach everything except providing side relief channels along the inner circumference of the pin bore. DeBiasse teaches that it is old in the art to provide side relief channels 68 along the inner circumference of the pin bore. It would have been obvious to one having ordinary skill in the art to modify JP404000063A in view of Hart et al by providing side relief channels, in order to accumulate lubricating oil to lubricate between the surfaces of the pin and bore.

Claims 3, 9, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP404000063A in view of Hart et al (6,557,457) as applied to claims 1, 2, 4-8, 11-13, 15, and 16 above, and further in view of Lindstrom (5,039,285). JP404000063A in view of Hart et al show everything except an internal gallery between the first and second ends of the connecting rod to direct lubricant between said first and second ends. Lindstrom teaches that it is old in the art to provide an internal gallery 66 between first and second ends of the connecting rod 42 to direct lubricant between said first and second ends. It would have been obvious to one having ordinary skill in the art to modify JP404000063A in view of Hart et al by employing an internal gallery in the connecting rod to facilitate lubrication of the piston pin and crankshaft.

(10) Response to Argument

Appellant points out that the JP404000063A reference shows a connecting rod having a bushing and a multi-part piston pin, as shown in Figure 1, the pin including a

substantially cylindrical center portion 4 having a uniform outer diameter that is surrounded by a cylindrical bushing. Appellant points out that this center portion is not tapered. Appellant further points out that the pin further includes a pair of frustro-conically shaped end portions, which are held in place via end caps. Obviously, the examiner considered these end portions to be the tapered portions. Figure 6, which is referred to by Appellant as the other embodiment is actually Prior Art. Appellant then recites a list of features which the Japanese reference allegedly does not show. In fact the Japanese reference does show some of the features, but not all of them. In response to applicant's arguments against the Japanese reference individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In his discussion of the Hart et al reference, Appellant cites column 3, lines 9-12 of the Hart et al reference, which reads as follows: "The manganese phosphate coating 36 is preferably applied at an application weight of about 2.15+-.1.08 mg/cm.², and a grain size in the range of about 30.+-.15 .mu.m. The coating 36 further has a preferred surface roughness in the range of about Ra 2.0 to 3.0 .mu.m, an R.sub.t in the range of about 11.0 to 26 .mu.m, **and a depth or thickness of about 8.0 to 15.0 .mu.m** [emphasis added]." Appellant claims that the reference argues the importance of the coating having a thickness of 8.0 to 15.0 micrometers, but in fact the reference

merely cites that the range is “**about** 8 to 15 micrometers” and makes no argument regarding the importance of that range.

The remainder of the remarks drawn to the Hart et al reference concern features which the Hart et al reference was not relied upon to show.

In discussing each of the other references individually, Appellant again applies the same type of reasoning and attacks each reference individually for not showing the entire invention. In response to this type of reasoning, the examiner can only reiterate the principle that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant then goes on to summarize the claimed invention in Part 7 entitled “The present invention.”

In Part C entitled “Discussion” Appellant recites several instances of case law, which he apparently intends to provide support for his contention that the motivation to combine references is lacking.

Appellant argues that the examiner has provided an-unconvincing motivation to combine references, because “the alleged motivation supplied by the examiner cannot be found in the references and is simply a conclusory interpretation of what the references teach.” The examiner has cited evidence from the Hart et al reference as to the motivation to combine it with the primary Japanese reference as follows:

JP404000063A utilizes a bushing for the piston pin, as is conventional in the art. The

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Hart et al reference teaches the advantage of utilizing a phosphatized coating as a means of eliminating the bushing and notes the following:

The coating absorbs and traps lubricating oil and develops a stiff lubricant squeeze film between the mating running surfaces of the connecting rod and wrist pin to provide the necessary tribological properties, eliminating the need for a conventional Cu-based bushing.

The invention has the further advantage of minimizing or eliminating the concern over bushing wear from increased levels of abrasive contaminants. The steel pins and connecting rods along with the coating are resistant to wear from such contaminants.

By eliminating the bushing, a cost savings is also recognized in both the material and labor of installation along with a reduction in the weight of the piston assembly.

So, as Appellant can readily see, there is ample motivation to combine references, since the Japanese reference would benefit by the ability to eliminate the bushing, as explained above.

Appellant further asserts that the examiner has failed to cite language from the JP404000063A reference that would suggest a motivation to combine it with Hart et al. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the suggestion comes from the Hart et al reference, as well as knowledge generally available to one of ordinary skill in the art. One of ordinary skill in the art is aware that the conventional

piston pin bushing is subject to wear, and that eliminating the bushing would realize cost savings in material and labor of installation as well as a reduction in the weight of the piston assembly. The Hart et al reference provides a teaching, which would enable the removal of the conventional bushing from the conventional piston by replacing it with a phosphatized coating, which is cheaper and lighter.

Appellant further maintains that the examiner "simply concludes that the problem addressed by JP2-10082 [i.e. JP404000063A] is the same as the problem addressed by Hart et al (i.e. reducing mass by eliminated a bushing). Yet, JP2-100821 [i.e. JP404000063A] teaches a bushing and multi-part pin, both of which add mass and maintain conventionally known lubrication characteristics." This is truly twisted logic. Obviously, the examiner cannot rely upon the Japanese reference to teach the features shown by the Hart et al reference, but this does not mean that the Hart et al reference teaches away from the teaching of the Japanese reference.

Appellant further argues that the coating thickness shown by the Hart et al reference is excessive and therefore does not have the same properties as the coating thickness between 2 and less than 8 microns. The phosphatized coating of Hart et al has "a depth or thickness of **about** 8.0 to 15 micrometers [emphasis added, see column 3, lines 9-12 of Hart et al]." Hart et al does not argue the importance of a thickness between 8.0 to 15.0 micrometers, as stated by applicant. As noted in the above rejection, according to MPEP 2144.05 (1), a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Appellant

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has amended the claims, which originally cited a range of 2 to 8 micrometers, by adjusting the range to 2 to **less than** 8 micrometers, apparently in order to avoid overlapping with the range taught by Hart et al of about 8 to 15 micrometers. This indicates to the examiner that the upper end of the range being less than 8 micrometers is one of expediency in trying to overcome the rejection rather than being truly important to the proper functioning of the invention. Furthermore, it is only common sense that the depth or thickness of the coating could be adjusted to suit the application involved, such as, for instance utilizing a smaller coating with a smaller piston-engine or a larger coating with a larger piston-engine.

Note that as the other references mentioned by the examiner in the Final Rejection were only cited as of interest, the examiner will not responds to Appellant's remarks regarding them.

Appellant further suggests that since tolerances between the piston pin and the pin bore are critical; that the specific thickness range is also critical, and that it would not be practical to adjust the thickness range relative to the size of the engine. The examiner finds this unconvincing, because in an engine application of a larger size, common sense would suggest that the tolerances would be larger. Similarly, in a smaller engine application, tolerances should be smaller. The tolerance ranges are commensurate with the size of the components employed. However, even if the what Appellant claims were true, and the coating depth must remain within the range of 2 to less than 8 micrometers, the closeness of the ranges suggested by the Hart et al reference and that of Appellant would suggest that one skilled in the art would have

expected them to have the same properties. This is particularly true in light of the fact that the original claims cited an overlapping range of 2 to 8 micrometers, and this range is mentioned in the specification (see last full sentence of page 5 of the specification).

Appellant further argues that the coating range of between two and less than eight microns is in contrast to the teachings of Hart et al because this range results in less vibration, engine noise or premature wear. The examiner finds this reasoning unconvincing for the reasons discussed above, and further notes that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272,205 USPQ 215 (CCPA 1980). Thus, discovering the optimum thickness of a coating is a feature that would be considered to be within the purview of one of ordinary skill in the art.

Appellant further argues that the elements shown by the Lindstrom '285 bear no relation to the combination of a profiled piston pin and a bushingless connecting rod including a phosphatized coating." The examiner is uncertain as to the thrust of this argument, but will try to respond. The Lindstrom reference shows an engine having a piston with a piston pin and connecting rod and an internal gallery 66 between first and second ends of the connecting rod 42 to direct lubricant between said first and second ends. It would have been obvious to one having ordinary skill in the art to modify JP404000063A in view of Hart et al by employing an internal gallery in the connecting rod to facilitate lubrication of the piston pin and crankshaft, which eases friction.

Appellant's additional arguments fail to comply with 37 CFR 1.111(b) because they amount to either general allegations that the claims define a patentable invention

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without specifically pointing out how the language of the claims patentably distinguishes them from the references, or further piecemeal analysis of the references without considering how they are being combined.

(11) Related Proceeding(s) Appendix


No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


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